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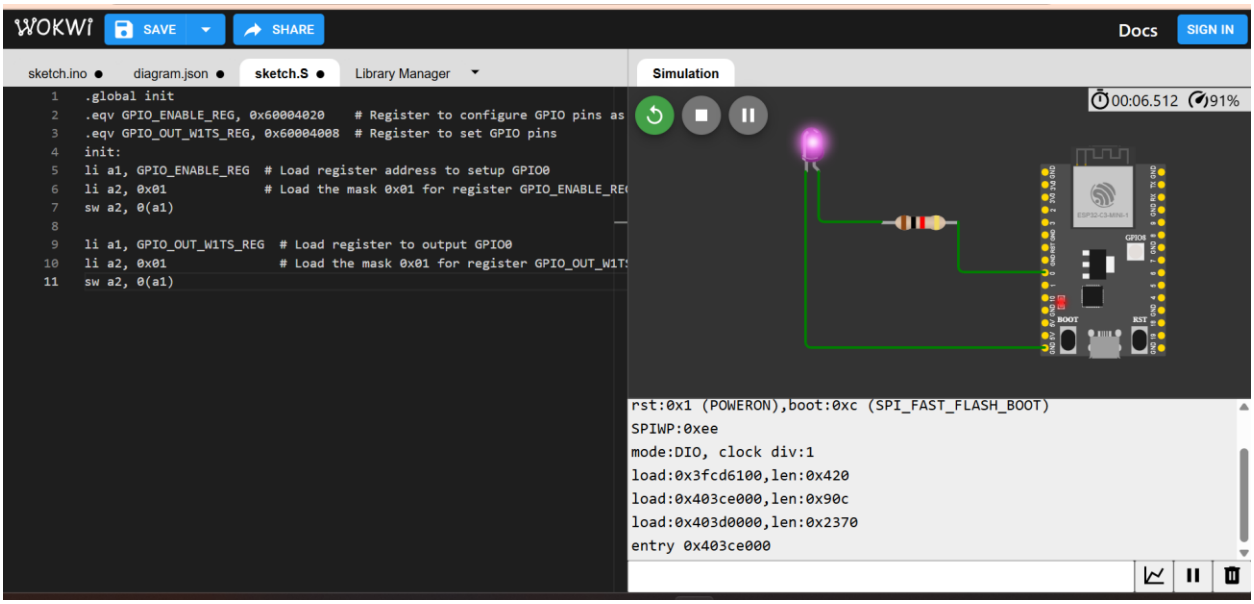
Student ID: 20236014

Lab 13

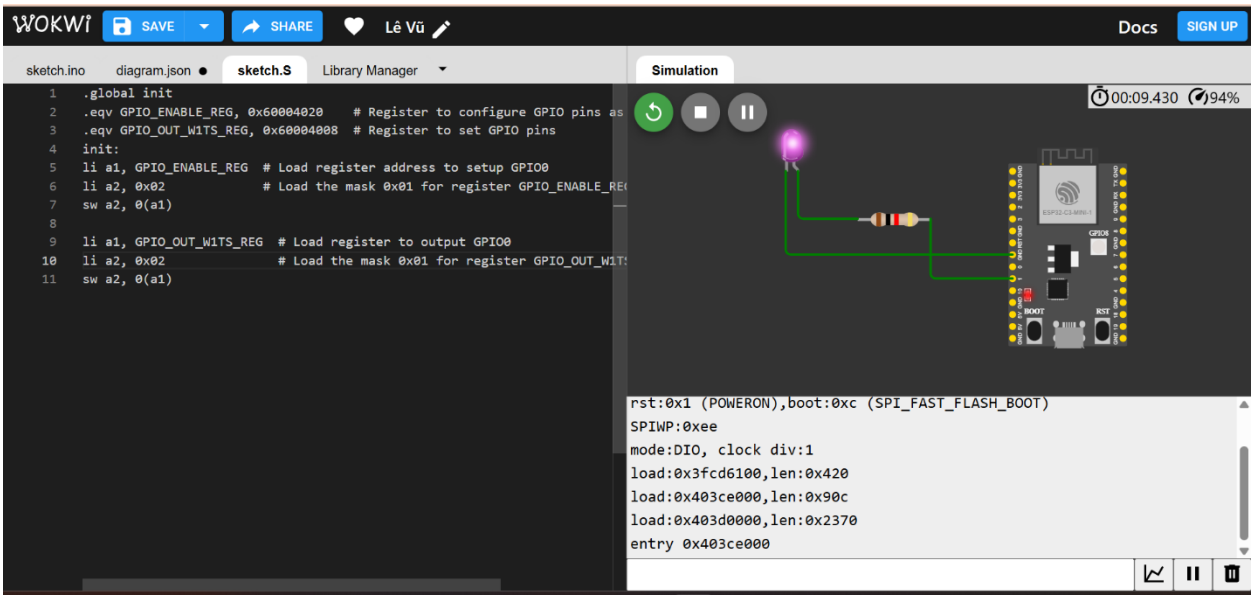
Assignment 1: Create a project to implement and test Home Assignment 1. Update the source code to test with other GPIO pins (GPIO2, GPIO3, GPIO4).

The result of implementing test Home Assignment 1:

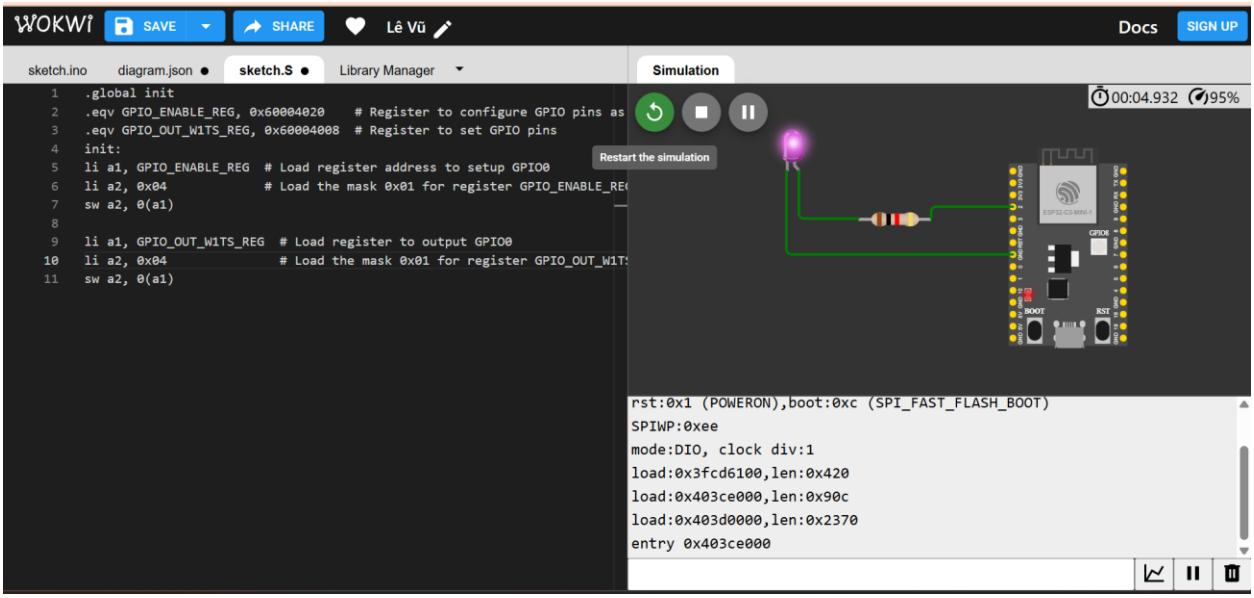


Update the source code to test with:

- GPIO1 pin:

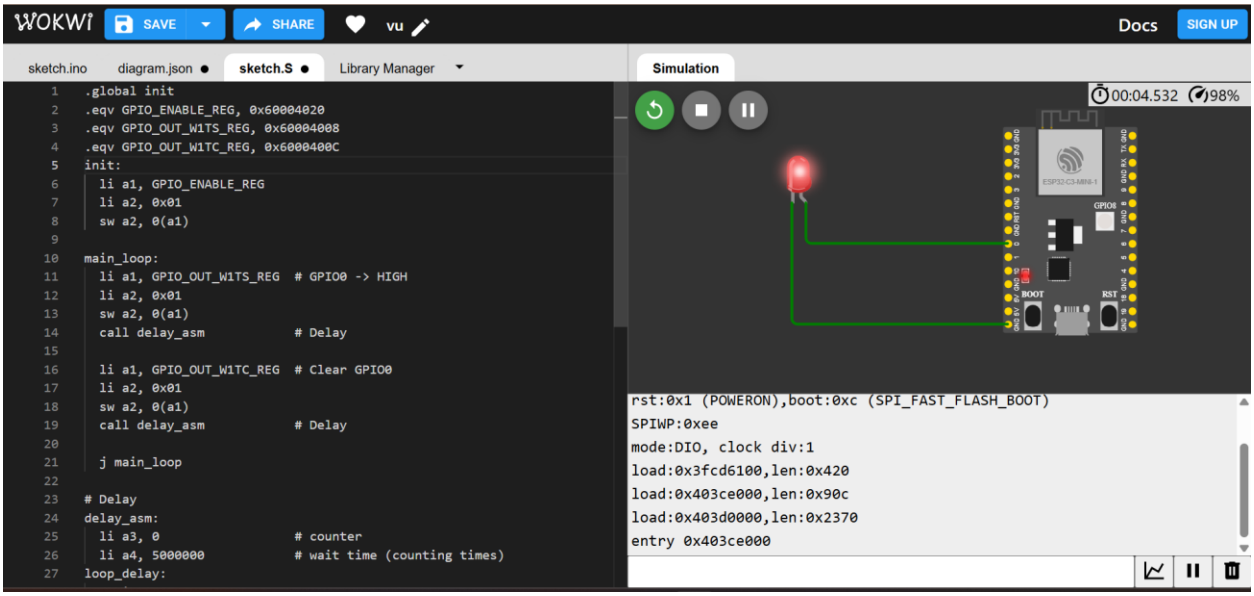


- GPIO2 pin:



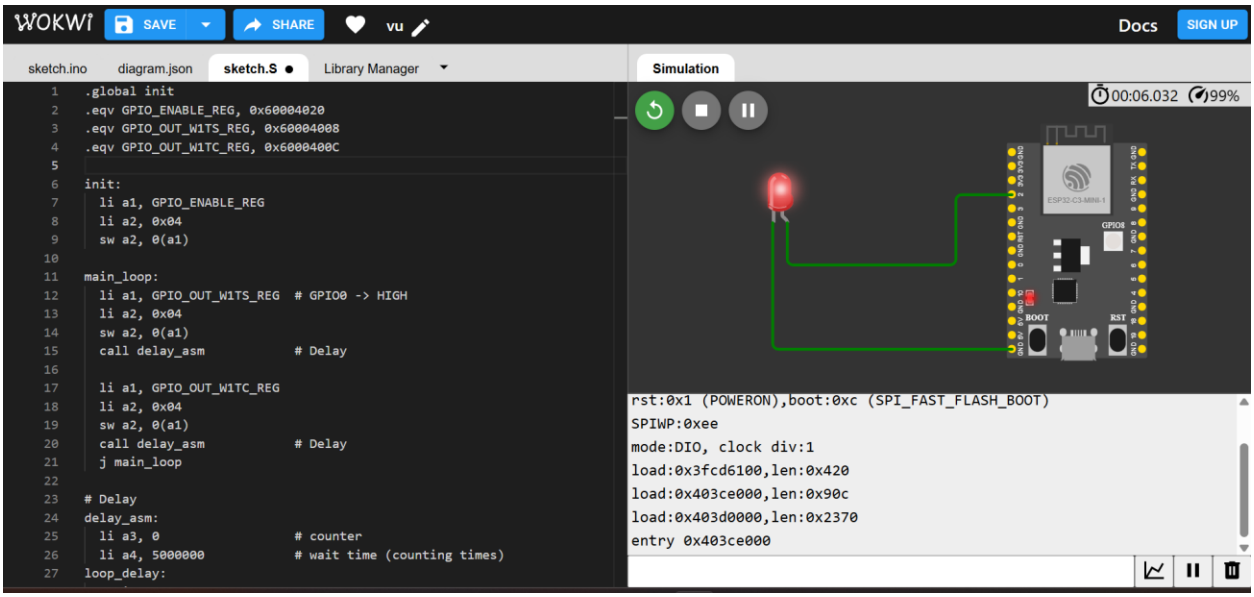
Assignment 2: Create a project to implement and test Home Assignment 2. Update the source code to test with other GPIO pins (GPIO2, GPIO3, GPIO4) and adjust the LED blinking duration.

Implementing and testing Home Assignment 2:

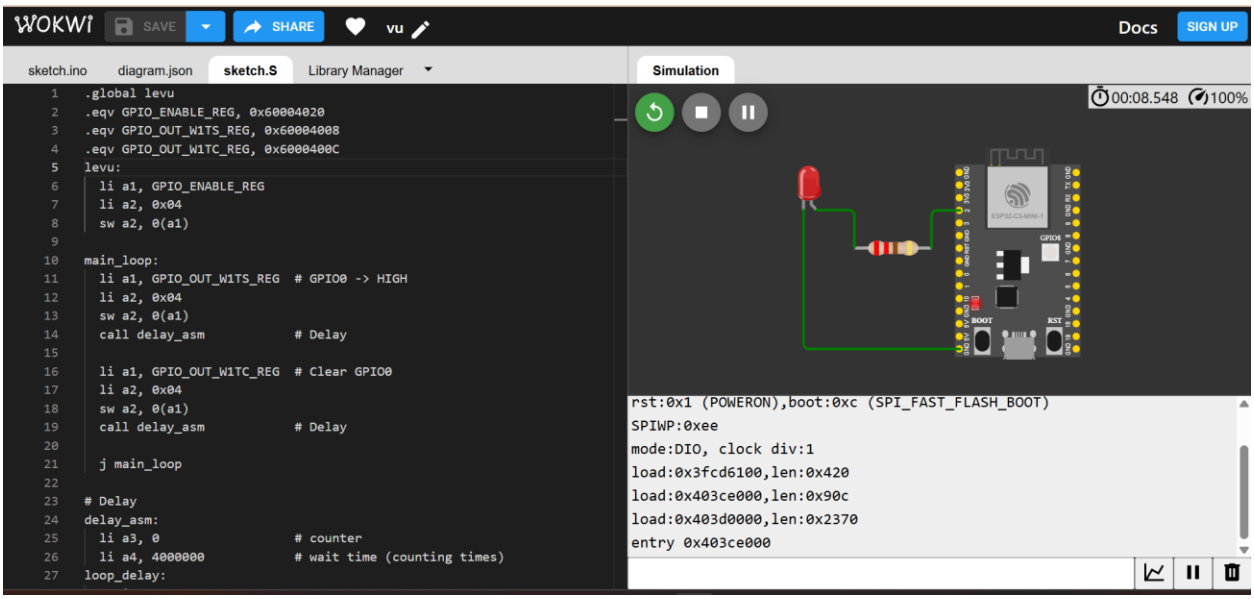


Update the source code to test with:

- GPIO2 pin:

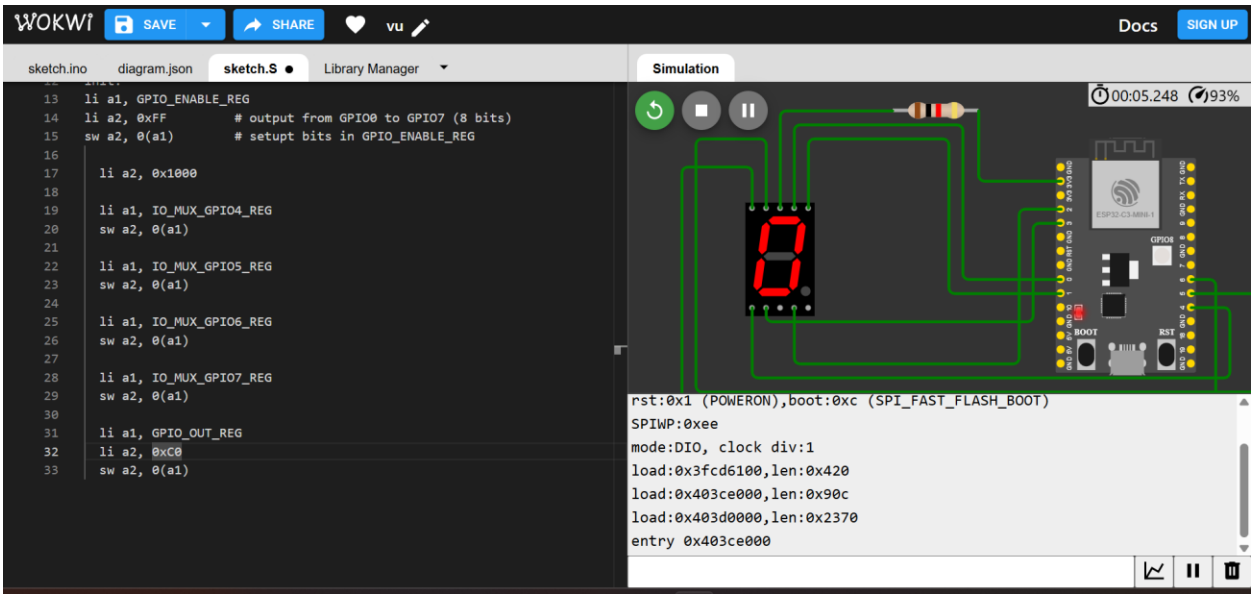


- Adjusting the LED blinking duration:

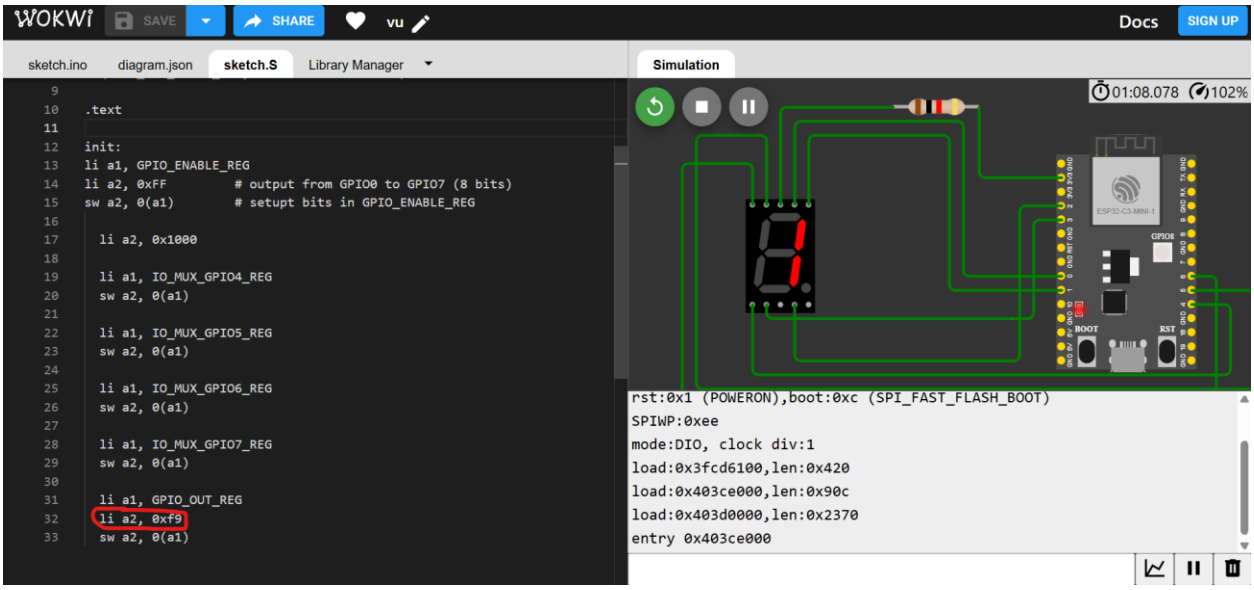


Assignment 3: Create a project to implement and test Home Assignment 3. Update the source code to display different digits (from 0 to 9).

Implementing and testing Home Assignment 3:



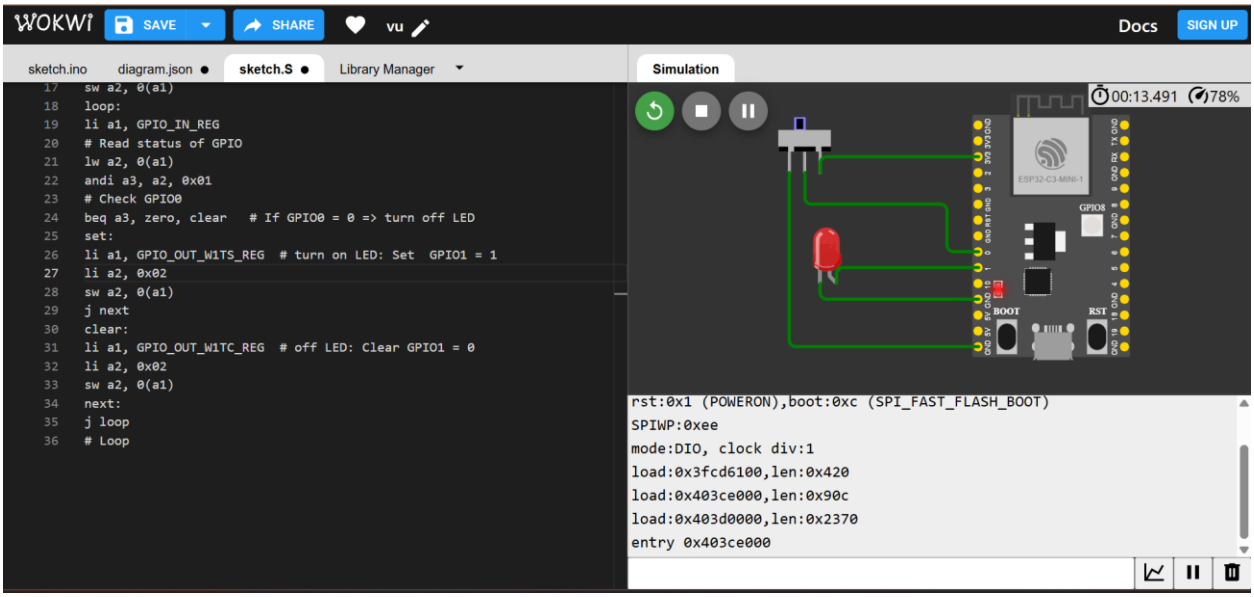
Update source code to display digit 1:



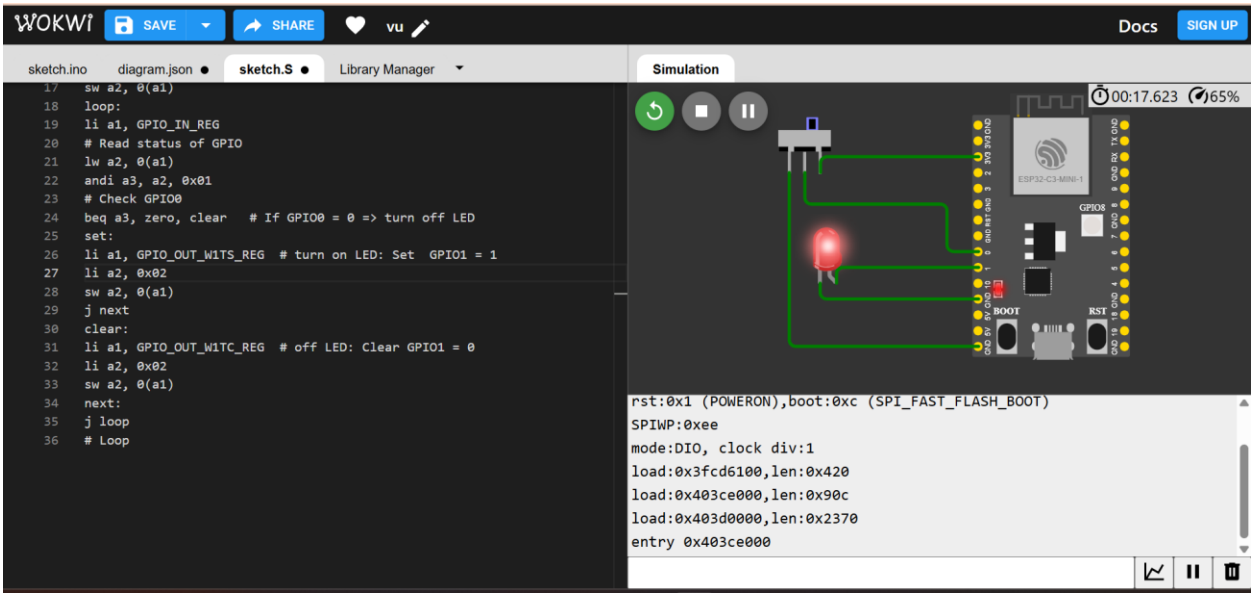
Assignment 4: Create a project to implement and test Home Assignment 4. Update the source code to use other GPIO pins (GPIO2, GPIO3, GPIO4) as signal input pins.

Implementing and testing Home Assignment 4:

- Turn off the LED:

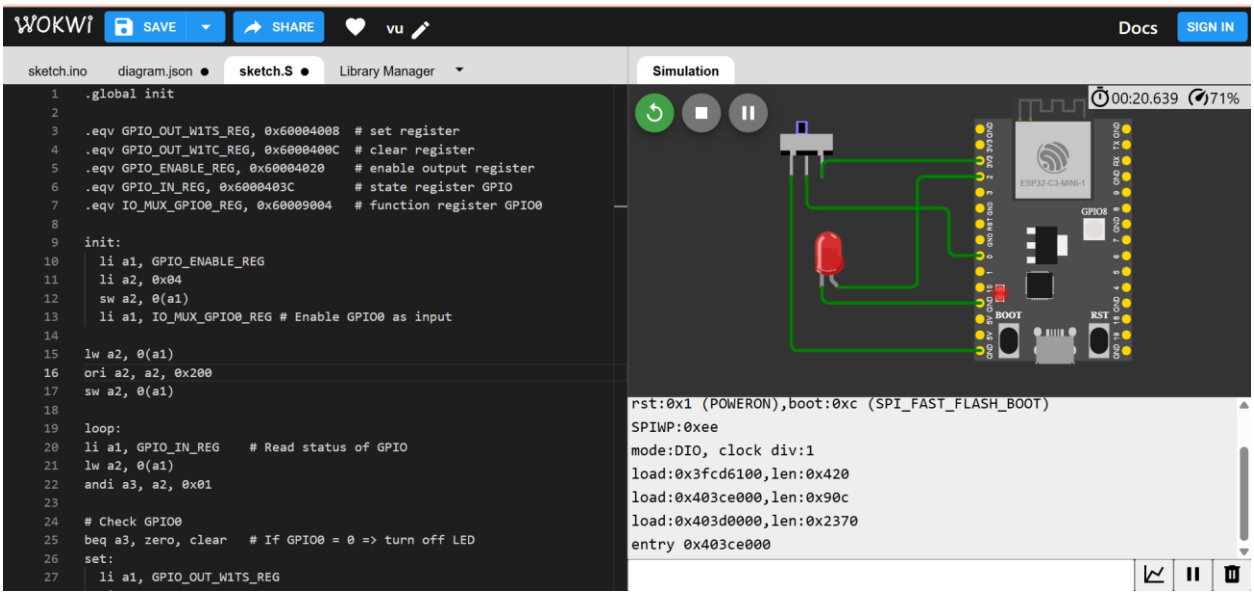


- Turn on the LED:

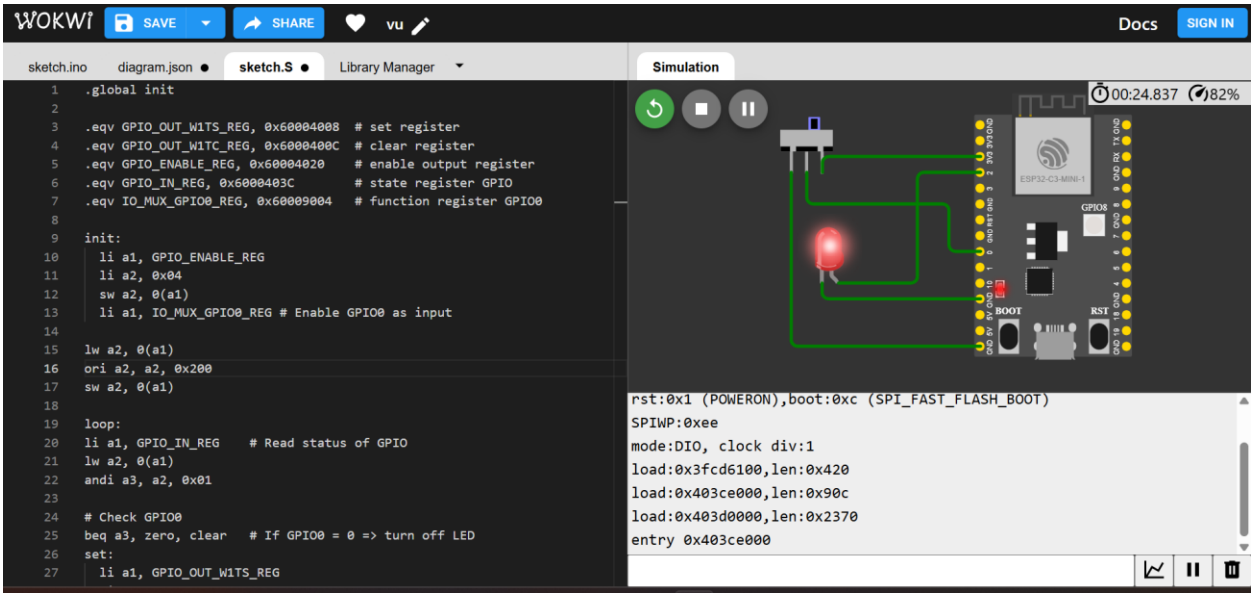


Update the source code to use GPIO2 pin:

- Turn off the LED:

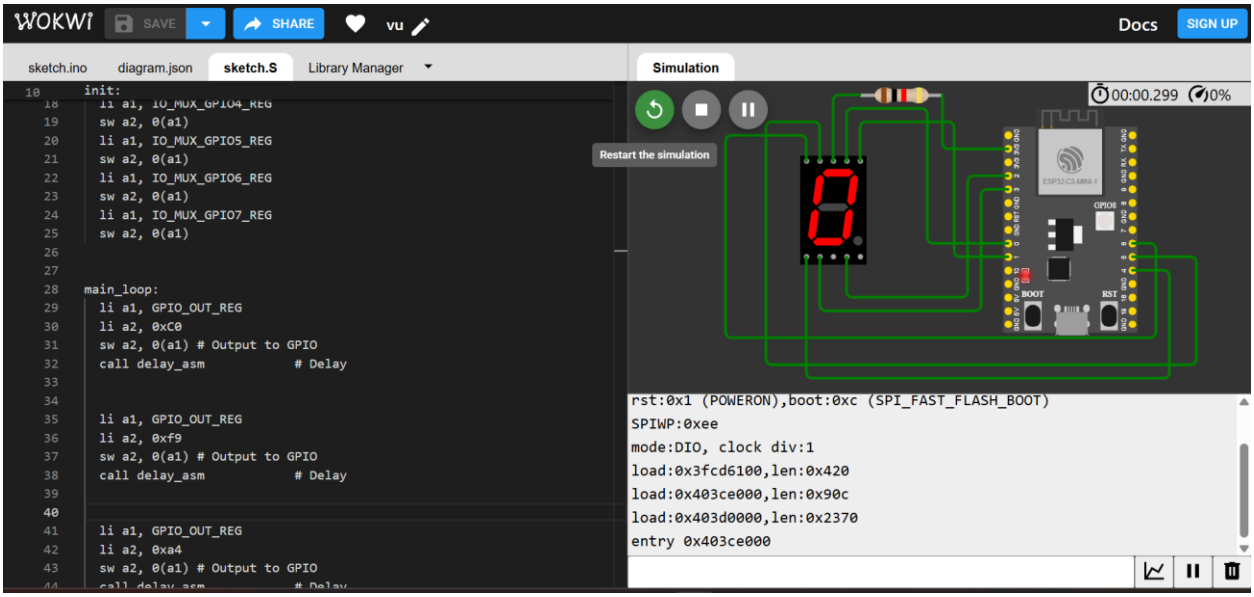


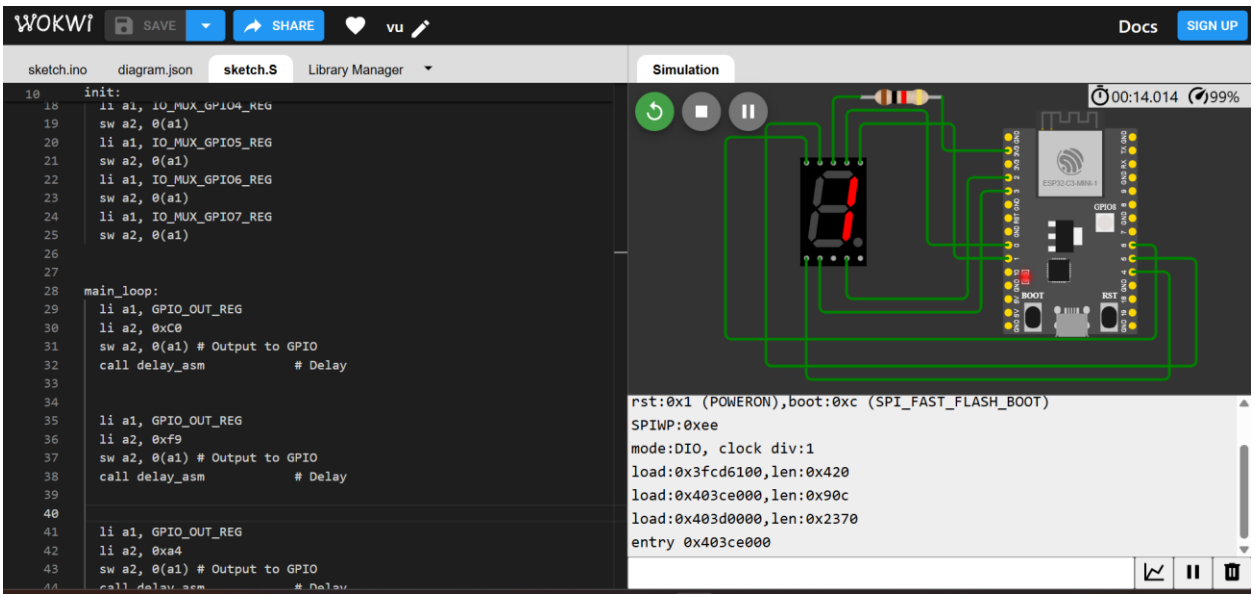
- Turn on the LED:

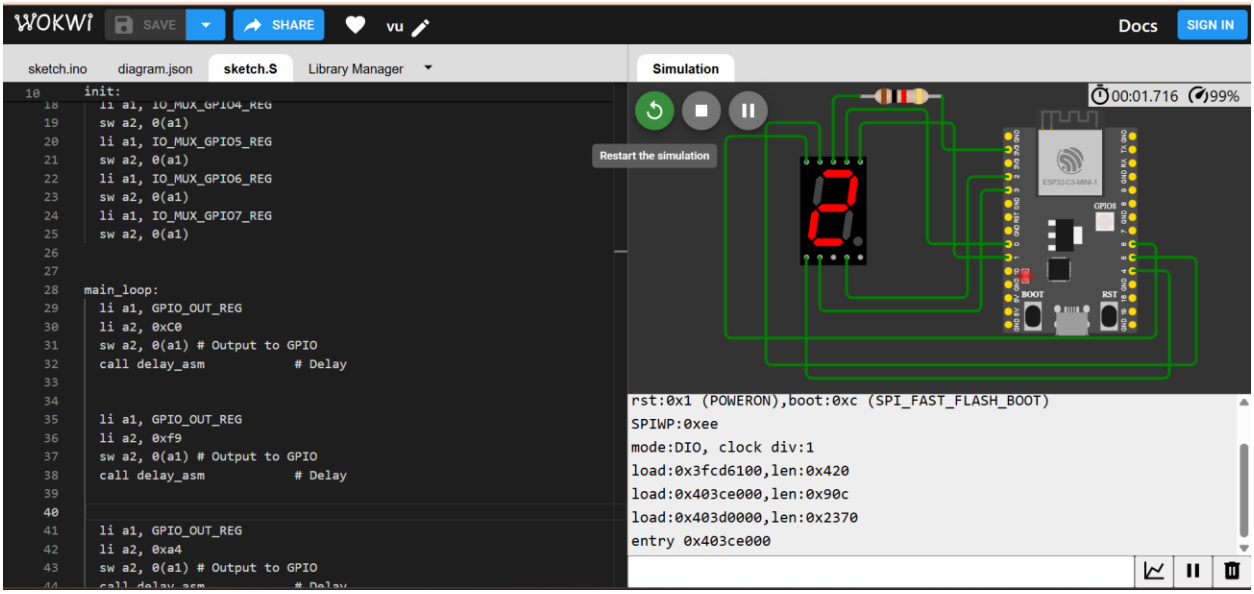


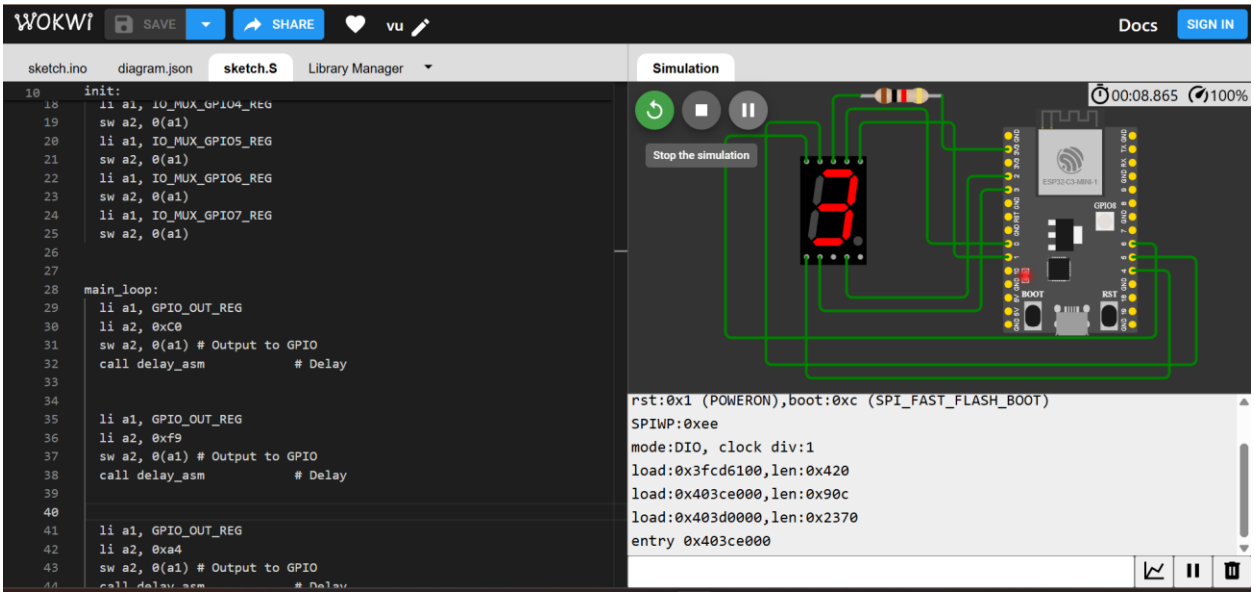
Assignment 5: Create a project to implement a circuit that counts from 0 to 9 on a 7-segment LED display

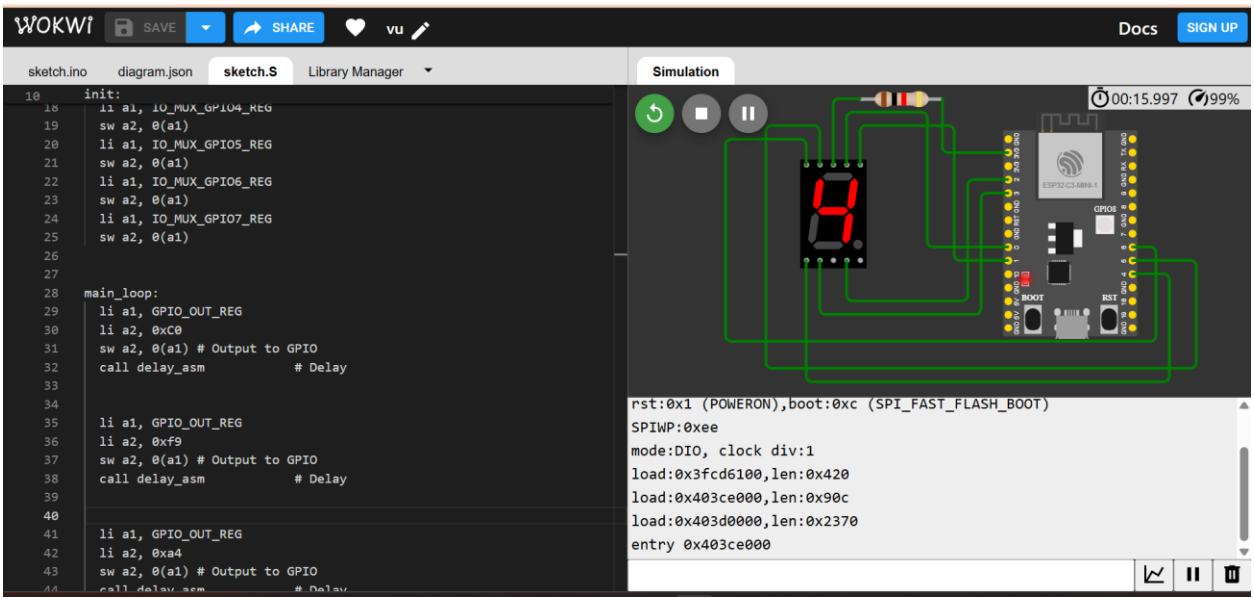
Counting from 0 to 9:

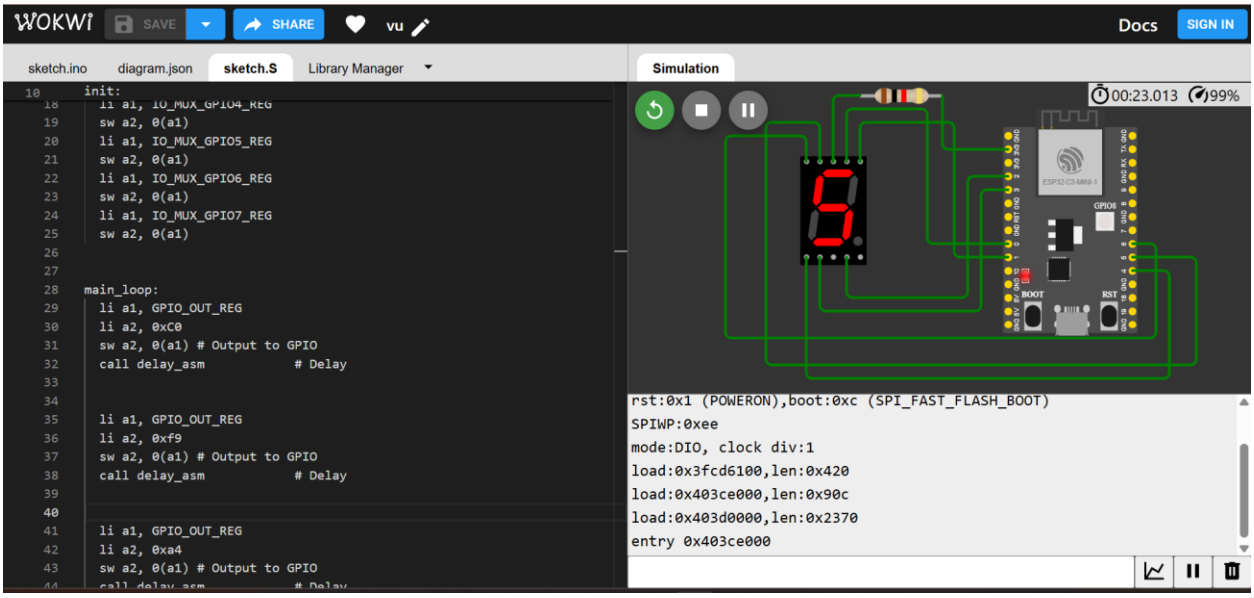

WOKWI
SAVE
SHARE
vu
Docs
SIGN UP
sketch.ino
diagram.json
sketch.S
Library Manager
Simulation
Restart the simulation
00:00.299
0%
init:
li a1, IO_MUX_GPIO4_REG
sw a2, 0(a1)
li a1, IO_MUX_GPIO5_REG
sw a2, 0(a1)
li a1, IO_MUX_GPIO6_REG
sw a2, 0(a1)
li a1, IO_MUX_GPIO7_REG
sw a2, 0(a1)
main_loop:
li a1, GPIO_OUT_REG
li a2, 0xC0
sw a2, 0(a1) # Output to GPIO
call delay_asm # Delay
li a1, GPIO_OUT_REG
li a2, 0xf9
sw a2, 0(a1) # Output to GPIO
call delay_asm # Delay
li a1, GPIO_OUT_REG
li a2, 0xa4
sw a2, 0(a1) # Output to GPIO
rst:0x1 (POWERON),boot:0xc (SPI_FAST_FLASH_BOOT)
SPIWP:0xee
mode:DIO, clock div:1
load:0x3fcd6100,len:0x420
load:0x403ce000,len:0x90c
load:0x403d0000,len:0x2370
entry 0x403ce000

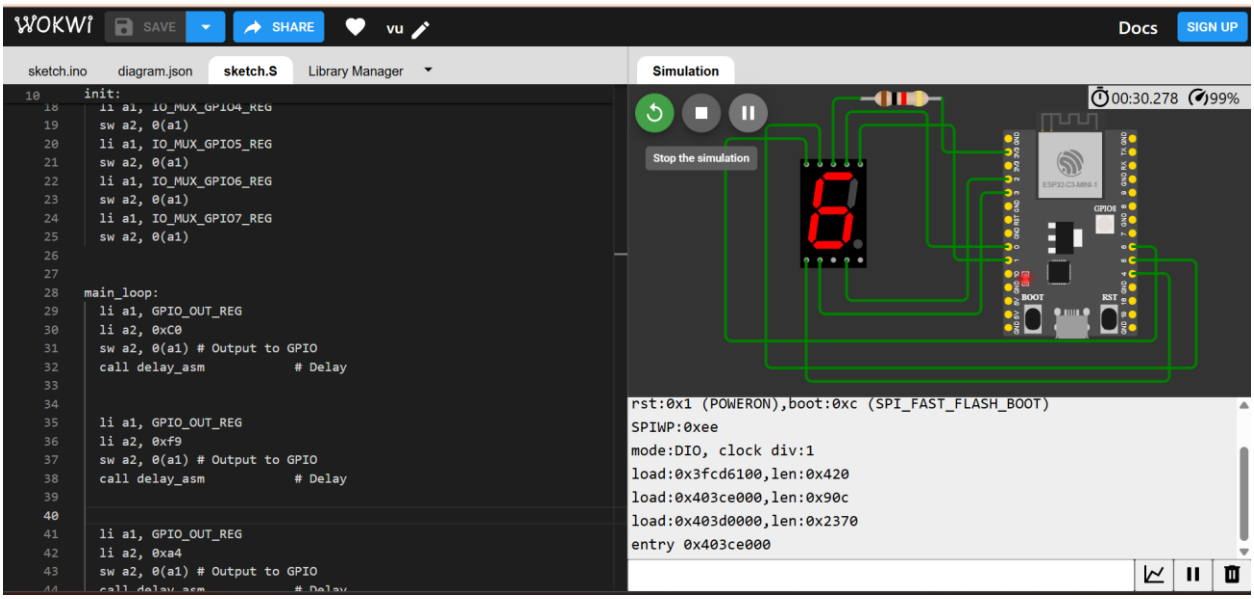

WOKWI
SAVE
SHARE
vu
Docs
SIGN UP
sketch.ino
diagram.json
sketch.S
Library Manager
Simulation
00:14.014
99%
init:
li a1, IO_MUX_GPIO4_REG
sw a2, 0(a1)
li a1, IO_MUX_GPIO5_REG
sw a2, 0(a1)
li a1, IO_MUX_GPIO6_REG
sw a2, 0(a1)
li a1, IO_MUX_GPIO7_REG
sw a2, 0(a1)
main_loop:
li a1, GPIO_OUT_REG
li a2, 0xC0
sw a2, 0(a1) # Output to GPIO
call delay_asm # Delay
li a1, GPIO_OUT_REG
li a2, 0xf9
sw a2, 0(a1) # Output to GPIO
call delay_asm # Delay
li a1, GPIO_OUT_REG
li a2, 0xa4
sw a2, 0(a1) # Output to GPIO
rst:0x1 (POWERON),boot:0xc (SPI_FAST_FLASH_BOOT)
SPIWP:0xee
mode:DIO, clock div:1
load:0x3fcd6100,len:0x420
load:0x403ce000,len:0x90c
load:0x403d0000,len:0x2370
entry 0x403ce000


WOKWI
SAVE
SHARE
vu
Docs
SIGN IN
sketch.ino
diagram.json
sketch.S
Library Manager
Simulation
Restart the simulation
00:01.716
99%
init:
sw a2, 0(a1)
li a1, IO_MUX_GPIO5_REG
sw a2, 0(a1)
li a1, IO_MUX_GPIO6_REG
sw a2, 0(a1)
li a1, IO_MUX_GPIO7_REG
sw a2, 0(a1)
main_loop:
li a1, GPIO_OUT_REG
li a2, 0xC0
sw a2, 0(a1) # Output to GPIO
call delay_asm # Delay
li a1, GPIO_OUT_REG
li a2, 0xf9
sw a2, 0(a1) # Output to GPIO
call delay_asm # Delay
li a1, GPIO_OUT_REG
li a2, 0xa4
sw a2, 0(a1) # Output to GPIO
rst:0x1 (POWERON),boot:0xc (SPI_FAST_FLASH_BOOT)
SPIWP:0xee
mode:DIO, clock div:1
load:0x3fcd6100,len:0x420
load:0x403ce000,len:0x90c
load:0x403d0000,len:0x2370
entry 0x403ce000

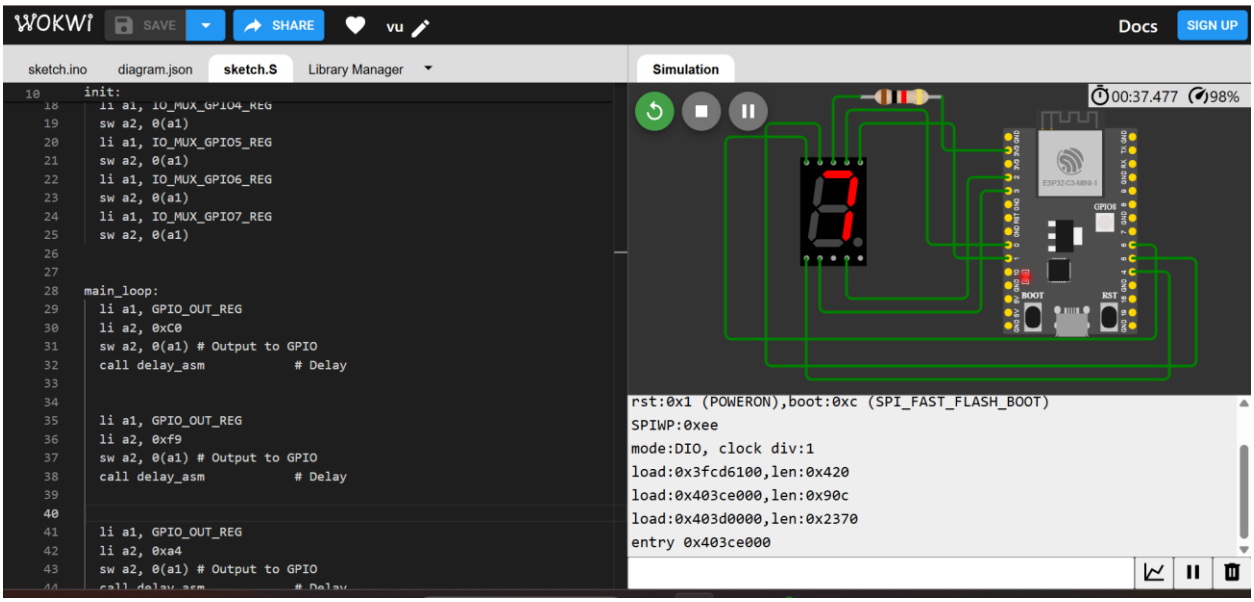

WOKWI
SAVE
SHARE
vu
Docs
SIGN IN
sketch.ino
diagram.json
sketch.S
Library Manager
Simulation
Stop the simulation
00:08.865
100%
init:
sw a2, 0(a1)
li a1, IO_MUX_GPIO5_REG
sw a2, 0(a1)
li a1, IO_MUX_GPIO6_REG
sw a2, 0(a1)
li a1, IO_MUX_GPIO7_REG
sw a2, 0(a1)
main_loop:
li a1, GPIO_OUT_REG
li a2, 0xC0
sw a2, 0(a1) # Output to GPIO
call delay_asm # Delay
li a1, GPIO_OUT_REG
li a2, 0xf9
sw a2, 0(a1) # Output to GPIO
call delay_asm # Delay
li a1, GPIO_OUT_REG
li a2, 0xa4
sw a2, 0(a1) # Output to GPIO
rst:0x1 (POWERON),boot:0xc (SPI_FAST_FLASH_BOOT)
SPIWP:0xee
mode:DIO, clock div:1
load:0x3fcd6100,len:0x420
load:0x403ce000,len:0x90c
load:0x403d0000,len:0x2370
entry 0x403ce000


WOKWI
SAVE
SHARE
vu
Docs
SIGN UP
sketch.ino
diagram.json
sketch.S
Library Manager
Simulation
00:15.997
99%
init:
sw a2, 0(a1)
li a1, IO_MUX_GPIO5_REG
sw a2, 0(a1)
li a1, IO_MUX_GPIO6_REG
sw a2, 0(a1)
li a1, IO_MUX_GPIO7_REG
sw a2, 0(a1)
main_loop:
li a1, GPIO_OUT_REG
li a2, 0xC0
sw a2, 0(a1) # Output to GPIO
call delay_asm # Delay
li a1, GPIO_OUT_REG
li a2, 0xf9
sw a2, 0(a1) # Output to GPIO
call delay_asm # Delay
li a1, GPIO_OUT_REG
li a2, 0xa4
sw a2, 0(a1) # Output to GPIO
rst:0x1 (POWERON),boot:0xc (SPI_FAST_FLASH_BOOT)
SPIWP:0xee
mode:DIO, clock div:1
load:0x3fcd6100,len:0x420
load:0x403ce000,len:0x90c
load:0x403d0000,len:0x2370
entry 0x403ce000

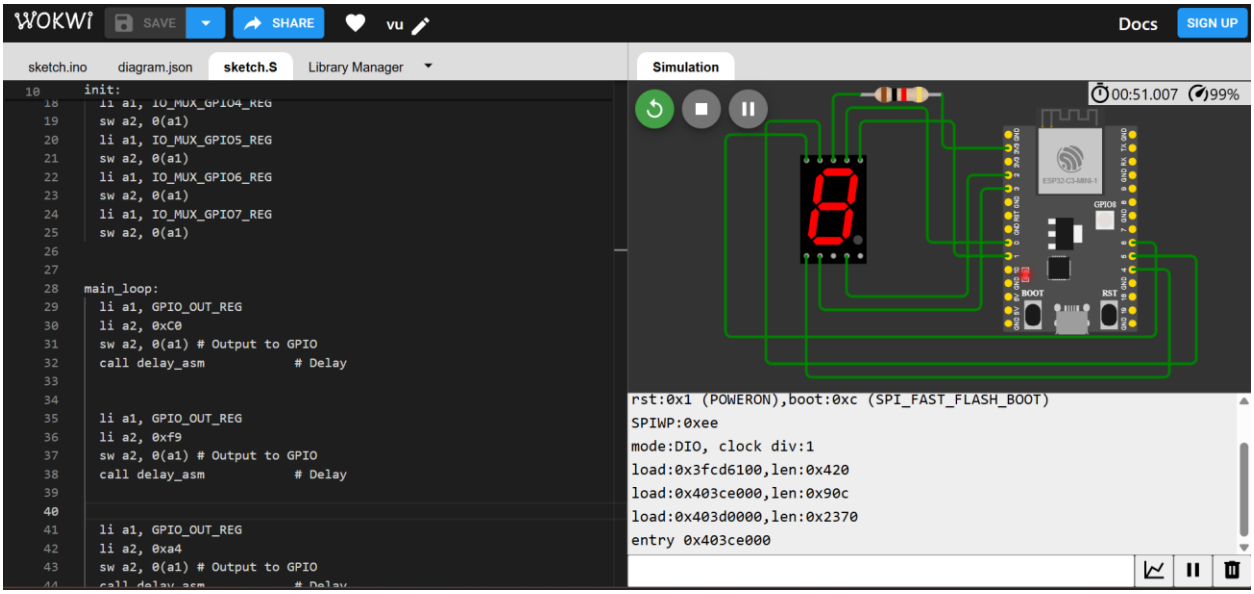

WOKWI
SAVE
SHARE
vu
Docs
SIGN IN
sketch.ino
diagram.json
sketch.S
Library Manager
Simulation
00:23.013
99%
init:
sw a2, 0(a1)
li a1, IO_MUX_GPIO5_REG
sw a2, 0(a1)
li a1, IO_MUX_GPIO6_REG
sw a2, 0(a1)
li a1, IO_MUX_GPIO7_REG
sw a2, 0(a1)
main_loop:
li a1, GPIO_OUT_REG
li a2, 0xC0
sw a2, 0(a1) # Output to GPIO
call delay_asm # Delay
li a1, GPIO_OUT_REG
li a2, 0xf9
sw a2, 0(a1) # Output to GPIO
call delay_asm # Delay
li a1, GPIO_OUT_REG
li a2, 0xa4
sw a2, 0(a1) # Output to GPIO
rst:0x1 (POWERON),boot:0xc (SPI_FAST_FLASH_BOOT)
SPIWP:0xee
mode:DIO, clock div:1
load:0x3fcd6100,len:0x420
load:0x403ce000,len:0x90c
load:0x403d0000,len:0x2370
entry 0x403ce000

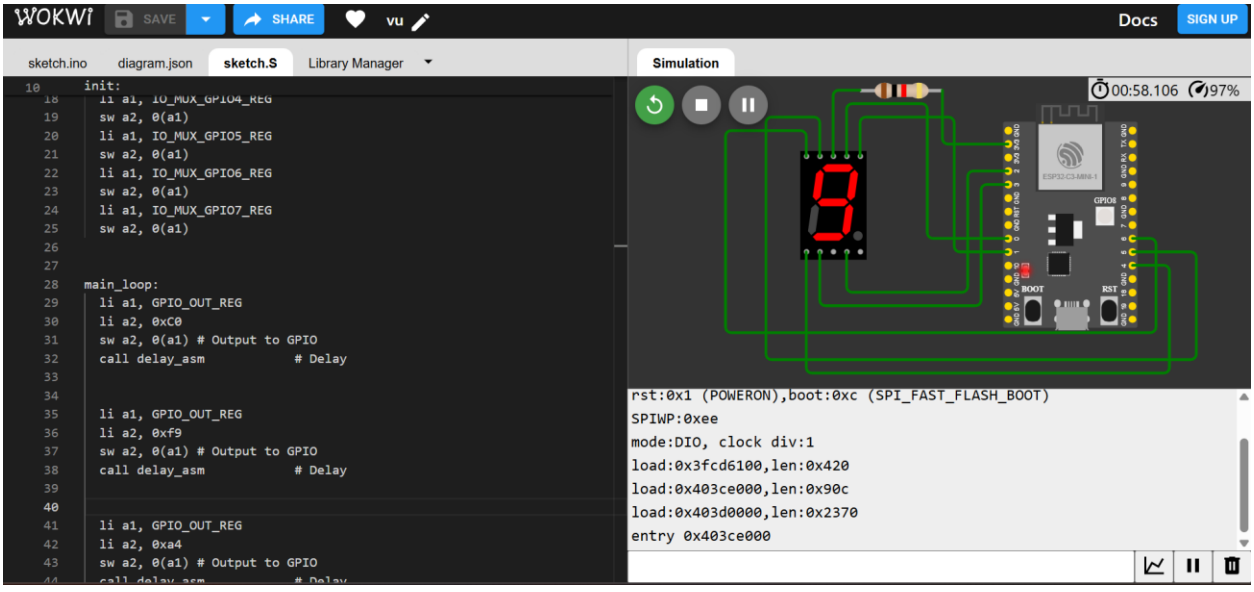



```
10  init:
18    li a1, IO_MUX_GPIO4_REG
19    sw a2, 0(a1)
20    li a1, IO_MUX_GPIO5_REG
21    sw a2, 0(a1)
22    li a1, IO_MUX_GPIO6_REG
23    sw a2, 0(a1)
24    li a1, IO_MUX_GPIO7_REG
25    sw a2, 0(a1)
26
27
28  main_loop:
29    li a1, GPIO_OUT_REG
30    li a2, 0xC0
31    sw a2, 0(a1) # Output to GPIO
32    call delay_asm            # Delay
33
34
35    li a1, GPIO_OUT_REG
36    li a2, 0xf9
37    sw a2, 0(a1) # Output to GPIO
38    call delay_asm            # Delay
39
40
41    li a1, GPIO_OUT_REG
42    li a2, 0xa4
43    sw a2, 0(a1) # Output to GPIO
44    call delay_asm            # Delay
```




```
10  init:
18    li a1, IO_MUX_GPIO4_REG
19    sw a2, 0(a1)
20    li a1, IO_MUX_GPIO5_REG
21    sw a2, 0(a1)
22    li a1, IO_MUX_GPIO6_REG
23    sw a2, 0(a1)
24    li a1, IO_MUX_GPIO7_REG
25    sw a2, 0(a1)
26
27
28  main_loop:
29    li a1, GPIO_OUT_REG
30    li a2, 0xC0
31    sw a2, 0(a1) # Output to GPIO
32    call delay_asm            # Delay
33
34
35    li a1, GPIO_OUT_REG
36    li a2, 0xf9
37    sw a2, 0(a1) # Output to GPIO
38    call delay_asm            # Delay
39
40
41    li a1, GPIO_OUT_REG
42    li a2, 0xa4
43    sw a2, 0(a1) # Output to GPIO
44    call delay_asm            # Delay
```


WOKWI
SAVE
SHARE
vu
Docs
SIGN UP
sketch.ino
diagram.json
sketch.S
Library Manager
Simulation
00:51.007
99%
init:
li a1, IO_MUX_GPIO4_REG
sw a2, 0(a1)
li a1, IO_MUX_GPIO5_REG
sw a2, 0(a1)
li a1, IO_MUX_GPIO6_REG
sw a2, 0(a1)
li a1, IO_MUX_GPIO7_REG
sw a2, 0(a1)
main_loop:
li a1, GPIO_OUT_REG
li a2, 0xC0
sw a2, 0(a1) # Output to GPIO
call delay_asm # Delay
li a1, GPIO_OUT_REG
li a2, 0xf9
sw a2, 0(a1) # Output to GPIO
call delay_asm # Delay
li a1, GPIO_OUT_REG
li a2, 0xa4
sw a2, 0(a1) # Output to GPIO
rst:0x1 (POWERON),boot:0xc (SPI_FAST_FLASH_BOOT)
SPIWP:0xee
mode:DIO, clock div:1
load:0x3fcd6100,len:0x420
load:0x403ce000,len:0x90c
load:0x403d0000,len:0x2370
entry 0x403ce000


WOKWI
SAVE
SHARE
vu
Docs
SIGN UP
sketch.ino
diagram.json
sketch.S
Library Manager
Simulation
00:58.106
97%
init:
li a1, IO_MUX_GPIO4_REG
sw a2, 0(a1)
li a1, IO_MUX_GPIO5_REG
sw a2, 0(a1)
li a1, IO_MUX_GPIO6_REG
sw a2, 0(a1)
li a1, IO_MUX_GPIO7_REG
sw a2, 0(a1)
main_loop:
li a1, GPIO_OUT_REG
li a2, 0xC0
sw a2, 0(a1) # Output to GPIO
call delay_asm # Delay
li a1, GPIO_OUT_REG
li a2, 0xf9
sw a2, 0(a1) # Output to GPIO
call delay_asm # Delay
li a1, GPIO_OUT_REG
li a2, 0xa4
sw a2, 0(a1) # Output to GPIO
rst:0x1 (POWERON),boot:0xc (SPI_FAST_FLASH_BOOT)
SPIWP:0xee
mode:DIO, clock div:1
load:0x3fcd6100,len:0x420
load:0x403ce000,len:0x90c
load:0x403d0000,len:0x2370
entry 0x403ce000